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(54) Title: SYSTEM AND METHOD FOR SPEECH PROCESSING USING INDEPENDENT COMPONENT ANALYSIS UNDER STABILITY CONSTRAINTS
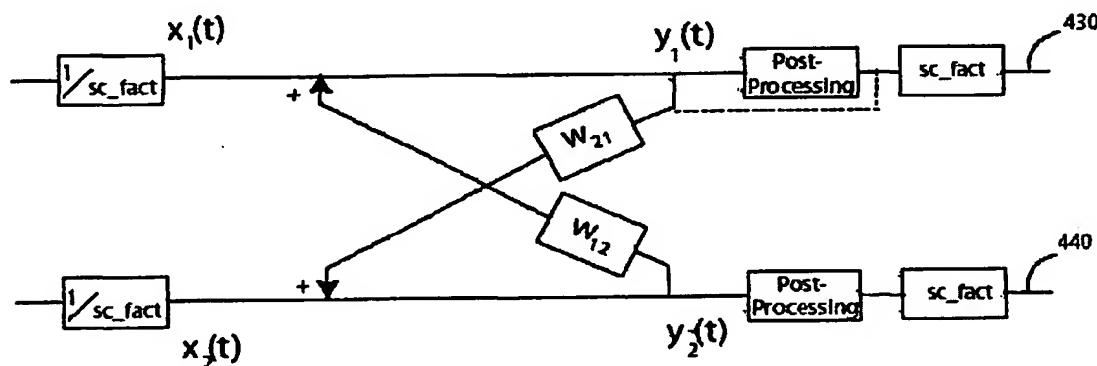
(57) Abstract: A system and method for separating a mixture of audio signal into desired audio signals (430) (e.g., speech) and a noise signal (440) is disclosed. Microphones (310, 320) are positioned to receive the mixed audio signals, and an independent component analysis (ICA) processes (212) the sound mixture using stability constraints. The ICA process (508) uses predefined characteristics of the desired speech signal to identify and isolate a target sound signal (430). Filter coefficients are adapted with a learning rule and filter weight update dynamics are stabilized to assist convergence to a stable separated ICA signal result. The separated signals may be peripherally-processed to further reduce noise effects using post-processing (214) and pre-processing (220, 230) techniques and information. The proposed system is designed and easily adaptable for implementation on DSP units or CPUs in audio communication hardware environments.

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